

WHAT IS CLAIMED IS:

*Subj. Pat.*

1. A method for mechanically opening at least one blood vessel in the neck of a slaughter animal, in particular a fowl, comprising:  
positioning the neck of the slaughter animal; and  
opening the at least one blood vessel,  
wherein the at least one blood vessel is opened by moving at least one cutting device along a path and into the neck from one side of the neck towards an opposite side of the neck, the at least one blood vessel to be opened being located in the path of the cutting device.

2. The method of claim 1, wherein the cutting device comprises a substantially elongate blade having a sharp, inclined front side and a longitudinal axis, wherein the blade is moved along the path substantially in a direction parallel to its longitudinal axis, the at least one blood vessel which is to be opened being located in the path of the inclined side of the blade.

3. The method of claim 2, wherein the blade is moved to and fro substantially along a line.

*Sub 2*  
4. The method of claim 1, wherein the at least one blood vessel opened comprises at least one jugular vein and at least one carotid artery.

5. The method of claim 1, wherein, before the at least one blood vessel is opened, the body of the slaughter animal is positioned below the neck of the slaughter animal.

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6. The method of claim 5, wherein the slaughter animal is hung by its head.

7. The method of claim 1, wherein, after the at least one blood vessel has been opened, the body of the slaughter animal is positioned higher than the area of the opening.

8. The method of claim 6, wherein, after the at least one blood vessel has been opened, at least one leg of the slaughter animal engages a carrier, whereby the slaughter animal is at least partially supported by the carrier.

9. The method of claim 1, wherein, before the at least one blood vessel is opened, the distance between

the trachea and the at least one blood vessel is increased.

10. The method of claim 9, wherein, before the at least one blood vessel is opened, the distance between the esophagus and the at least one blood vessel is also increased in the area of the opening.

11. The method of claim 9, wherein said distance is increased by moving at least two separating members, each having an end, into the neck of the slaughter animal until the ends of the two separating members are proximal to each other at a location between the trachea and the at least one blood vessel, in particular at a location between the esophagus and the at least one blood vessel, and then moving the separating members and a part of the neck apart substantially transversely with respect to the longitudinal direction of the neck.

12. The method of claim 11, wherein the neck is fixed in place and the separating members move with respect to a part of the neck.

13. The method of claim 12, wherein the separating members, after they have been moved into the neck, move towards the front side or the rear side of the neck.

14. The method of claim 1, wherein the slaughter animal is killed before the at least one blood vessel is opened.

15. The method of claim 14, wherein the slaughter animal is killed in a gas atmosphere.

16. A device for cutting into at least one blood vessel in the neck of a slaughter animal, in particular a fowl, comprising:

a neck positioning device for positioning the neck of the slaughter animal; and

a blood vessel opening device for opening the at least one blood vessel,

wherein the blood vessel opening device comprises at least one cutting device adapted to move along a cutting path through the neck from one side of the neck to another side of the neck, wherein the at least one blood vessel which is to be opened being located along the cutting path of the cutting device.

17. The device of claim 16, wherein the cutting device comprises a substantially elongate blade having a sharp, inclined front side and a longitudinal axis, wherein the blade is adapted to move along the cutting path substantially in a direction parallel to the longitudinal axis of the blade.

18. The device of claim 17, wherein the blade is adapted to be moved to and fro substantially along a line.

19. The device of claim 16, wherein the neck positioning device engages the neck in the area which extends from the underside of the head of the slaughter animal to the second cervical vertebra.

20. The device of claim 19, further comprising a head carrier for carrying the slaughter animal by its head.

21. The device of claim 20, wherein the head carrier comprises a substantially U-shaped carrying opening, the transverse dimension of which is smaller than the width of the head of the slaughter animal.

22. The device of claim 20, wherein the head carrier forms part of a conveyor having a conveyor path,

wherein the conveyor path at least extends from a location where slaughter animals are supplied to the location of the blood vessel opening device.

23. The device of claim 16, further comprising a separating device for increasing the distance between the trachea of the slaughter animal and the at least one blood vessel.

24. The device of claim 23, wherein the separating device is adapted to increase the distance between the esophagus and the at least one blood vessel.

25. The device of claim 23, wherein the separating device comprises two separating members, each having an end and adapted to be positioned adjacent the neck of the slaughter animal, wherein the separating members move from an open position into the neck into a closed position, whereby the ends of the separating members are moved proximal to each other at a location between the trachea or the esophagus and the at least one blood vessel.

26. The device of claim 25, wherein the end of at least one of the separating members is blunt.

27. The device of claim 25, wherein the separating members are adapted, in their closed position, to be moved towards the front side or the rear side of the neck.

28. The device of claim 16, further comprising a leg positioning device for positioning at least one leg of the slaughter animal in a leg support which interacts with the leg positioning device.

29. The device of claim 28, wherein the leg positioning device comprises a support which can tilt about an axis, for tilting at least part of the at least one leg from a substantially vertical position into a substantially horizontal position.

30. The device of claim 29, wherein said part of the leg extends below the knee joint.

31. The device of claim 29, wherein the support is adapted to support the breast of the slaughter animal.

32. The device of claim 29, wherein the support is provided with a gripper device for securely gripping the at least one leg.

33. The device of claim 28, further comprising one or more stops, which interact with the leg positioning device, for positioning the at least one leg substantially in a horizontal plane.

34. The device of claim 16, wherein the neck positioning device comprises a head support for supporting the head and a shoulder support for supporting the shoulders of the slaughter animal.

35. A device for imposing a distance between stunned or dead slaughter animals or parts thereof, the device comprising:

    a first conveyor for conveying the slaughter animals or parts thereof along a first conveyor path in a first direction, and

    a second conveyor leading from the first conveyor for conveying the slaughter animals or parts thereof along a second conveyor path in a second direction, wherein the first direction differs from the second direction.

36. The device of claim 35, wherein the angle between the first direction and the second direction is at least 45°.

37. The device of claim 35, wherein the second conveyor comprises a conveyor belt having walls positioned at substantially regular intervals along the conveyor belt, wherein the plane of each wall is oriented at an angle of at least 45° with respect to the plane of the conveyor belt.

38. A device for imposing a distance between stunned or dead slaughter animals or parts thereof, the device comprising:

a first conveyor having a discharge end for conveying the slaughter animals or parts along a first conveyor path in a first direction, and

a second conveyor, at least part of which extends beneath the discharge end of the first conveyor, for conveying the slaughter animals or parts thereof, wherein the second conveyor comprises a conveyor belt having walls positioned at substantially regular intervals along the conveyor belt, wherein the plane of each wall is oriented at an angle of at least 45° with respect to the plane of the conveyor belt.

39. The device of claim 35, further comprising a set of guides positioned substantially stationary above the first conveyor to delimit a passage that becomes narrower in the conveying direction, wherein the

passage has a minimum width which substantially corresponds to or is slightly greater than the smallest width dimension of the slaughter animal or the part thereof.

40. The device of claim 39, wherein one of the guides comprises a conveyor belt adapted to be driven in a direction substantially opposite to the first direction.

41. A device for orienting a stunned or dead slaughter animal, or a part thereof, the device comprising:

    a conveyor for conveying the slaughter animal or part thereof along a conveyor path and in a conveying direction; and

    an orientation device for transferring the slaughter animal or the part thereof from a first location in a first orientation to a second location and into a second orientation on the conveyor.

42. The device of claim 41, wherein the orientation device comprises a set of guides arranged substantially stationary above the conveyor to delimit a passage that becomes narrower in the conveying direction, wherein the passage has a minimum width which substantially

corresponds to the smallest width dimension of the slaughter animal or part thereof.

43. The device of claim 41, wherein the orientation device comprises a liquid bath having a set of guides arranged in the vicinity of the water surface to delimit a passage that becomes narrower in the conveying direction, wherein the passage has a minimum width which substantially corresponds to the smallest width dimension of the slaughter animal or part thereof.

44. The device of claim 41, wherein the orientation device comprises at least one manipulator to engage the slaughter animal or the part thereof, wherein the device further comprises:

an image processing system, arranged above the conveyor and upstream of at least one manipulator, for supplying image information relating to the slaughter animal or the part thereof located on the conveyor;

a data processing system coupled to the image processing system and the at least one manipulator,

the data processing system being adapted to determine, on the basis of the image information, the first location and the first orientation of the slaughter animal or the part thereof and to control the

manipulator to orient the slaughter animal or part thereof at the second location and in the second orientation.

45. The device of claim 44, wherein the manipulator comprises a drum arranged above the conveyor, wherein the drum has an axis of rotation and fingers projecting from the drum substantially radially with respect to the axis.

46. The device of claim 44, wherein the manipulator comprises a blowing nozzle arranged above the conveyor, wherein the nozzle comprises blowing openings and can pivot about an axis.

47. The device of claim 44, wherein the manipulator comprises at least one arm having a gripper device positioned at one end of the arm for securely gripping the slaughter animal or part thereof.

48. The device of claim 44, wherein the manipulator comprises a suction nozzle for sucking the slaughter animal or the part thereof.

49. The device of claim 41, wherein the orientation means comprises an elongate cylinder which can rotate about its longitudinal axis.

50. The device of claim 49, wherein the cylinder comprises a helical raised wall along an inner surface of the cylinder.

51. A device for hanging a slaughter animal from a hook, comprising:

a first conveyor, parallel to which a guide is arranged at a distance on either side; and

a second conveyor for advancing the hooks beneath and parallel to the first conveyor for hooking onto legs of the slaughter animal which is situated on the first conveyor.

52. A device for hanging a slaughter animal from a hook, comprising:

a conveyor with a conveying direction for conveying the slaughter animal with the legs oriented in the conveying direction;

a stop arranged above the conveyor for stopping conveyance of the slaughter animal; and

a gripper device for securely gripping the slaughter animal and hanging it from a hook.

53. A device for hanging a slaughter animal from a hook, comprising:

a belt conveyor for conveying the slaughter animal; and

a hook conveyor for advancing at least one hook upwardly towards an edge of the belt conveyor.

54. A device for hanging a slaughter animal from a hook, comprising:

two substantially parallel and synchronously driven belt conveyors arranged adjacent but at a distance from one another to form a gap between the belt conveyors, wherein the neck of the slaughter animal is positioned in the gap between the belt conveyors; and

a hook conveyor for advancing hooks along the underside of the belt conveyors and at least partially parallel thereto at the level of the gap for receiving the neck for hanging the slaughter animal by its head.

55. A device for hanging slaughter animals or parts thereof from hooks, comprising:

a moving conveyor surface for conveying the slaughter animals or parts thereof;

an overhead conveyor for conveying hooks and arranged partially above the conveyor surface,

wherein an upstream part of the overhead conveyor is arranged above a downstream part of the conveyor surface and a downstream part of the overhead conveyor is arranged above an upstream part of the conveyor surface.

56. A device for hanging slaughter animals or parts thereof from hooks, comprising:

a moving conveyor surface for conveying the slaughter animals or parts thereof;

an overhead conveyor for conveying hooks and arranged above the conveyor surface,

wherein a wall is positioned above the conveyor surface for blocking the slaughter animals or parts thereof conveyed on the conveyor surface.

57. The device of claim 55, wherein the conveyor surface is formed by an annular disc.

58. The device of claim 56, wherein the wall is displaceable.

59. A device for hanging slaughter animals or parts thereof from hooks, comprising:

a conveyor surface for conveying the slaughter animals or parts thereof, wherein the conveyor surface has a first side and a second side;

a number of ejectors arranged along the first side of the conveyor surface for ejecting the slaughter animals or parts thereof from the conveyor surface;

a number of holders arranged along the second side of the conveyor surface, opposite the ejectors, for collecting slaughter animals or parts thereof which have been ejected from the conveyor surface; and

an overhead conveyor for conveying the hooks and arranged partially above the holders.

60. A device for hanging slaughter animals or parts thereof from hooks, comprising:

a number of holders for the slaughter animals or parts thereof;

an overhead conveyor arranged partially above the holders; and

a conveyor surface for conveying the slaughter animals or parts thereof, wherein the conveyor surface has a discharge end which can be displaced for discharging the slaughter animals to a predetermined holder.

61. The method of claim 7, wherein, after the at least one blood vessel has been opened, at least one leg of the slaughter animal engages a carrier, whereby the slaughter animal is at least partially supported by the carrier.

62. The device of claim 38, further comprising a set of guides positioned substantially stationary above the first conveyor to delimit a passage that becomes narrower in the conveying direction, wherein the passage has a minimum width which substantially corresponds to or is slightly greater than the smallest width dimension of the slaughter animal or the part thereof.

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